

The Parasitization of Blister Beetles by Species of Miridae¹

(Coleoptera: Meloidae; Hemiptera: Miridae)

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The attraction of certain insects to living adult blister beetles for purposes of feeding is well documented. Ceratopogonid flies belonging to *Atrichopogon* (*Meloehhelea*) have been recorded pursuing meloids in swarms, piercing their intersegmental membrane and sucking hemolymph (Blair, 1937; Edwards, 1923). Various anthicid beetles in *Anthicus* and *Pedilus* have also been observed attacking and feeding on a variety of blister beetles (Pinto and Selander, 1970). That certain Miridae also feed on meloids has apparently not been as widely recognized. Two Canadian records, one by Fox (1943) of *Hadronema militaris* Uhler "attacking *Lytta nuttalli* Say," and another by Church and Gerber (1977) of this same mirid feeding on hemolymph of *L. nuttalli* and *L. viridana* LeConte, are the only published observations of this relationship of which I am aware.

Field work in southern California and in Arizona has convinced me that *Hadronema* spp., and perhaps other mirids, frequently attempt to feed on meloids. Most records involve *Hadronema uhleri* Van Duzee². This species has been associated with the following meloids: *Lytta moerens* (LeConte) (Menifee Valley, Riverside Co., CA), *L. crotchii* (Horn) (Gavilan Hills, Riverside Co., CA; G.R. Ballmer, observer and collector), *L. stygica* (LeConte) (Whitewater Cyn., Riverside Co., CA; L. Lacey, observer and collector), *Tegrodera erosa* LeConte (Menifee Valley), and *Cordylospasta opaca* (Horn) (Summit Valley, San Bernardino Mts. CA). In addition to *H. uhleri*, I have observed *H. bispinosa* Knight similarly associated with *Epicauta andersoni* Werner and *E. ventralis* Werner (3 mi. N. Flagstaff, AZ), and *Halticotoma nicholi* Knight, associated with *Megetra cancellata* (Brandt and Erichson) (Portal, AZ). A single *H. nicholi* was also taken feeding on an individual *Meloe laevis* Leach (Portal, AZ; S. I. Frommer, observer and collector).

Behavior of the mirids is similar in all cases. The following remarks, however, pertain specifically to *Hadronema uhleri* and *Lytta moerens* observed in Menifee Valley. A small population of 20 meloids, including several mated pairs, was found over ca. 50 m², feeding on flowers of *Astragalus* sp. on 14 May 1975. One to seven mirids occurred on the vegetation adjacent to almost every individual or mated pair of *Lytta*. The mirids, with rostrum directed forward, periodically advanced slowly toward a beetle (Fig. 1) and, upon reaching it, inserted the

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Identifications of all Miridae were verified by Dr. Randall T. Schuh of The American Museum of Natural History.

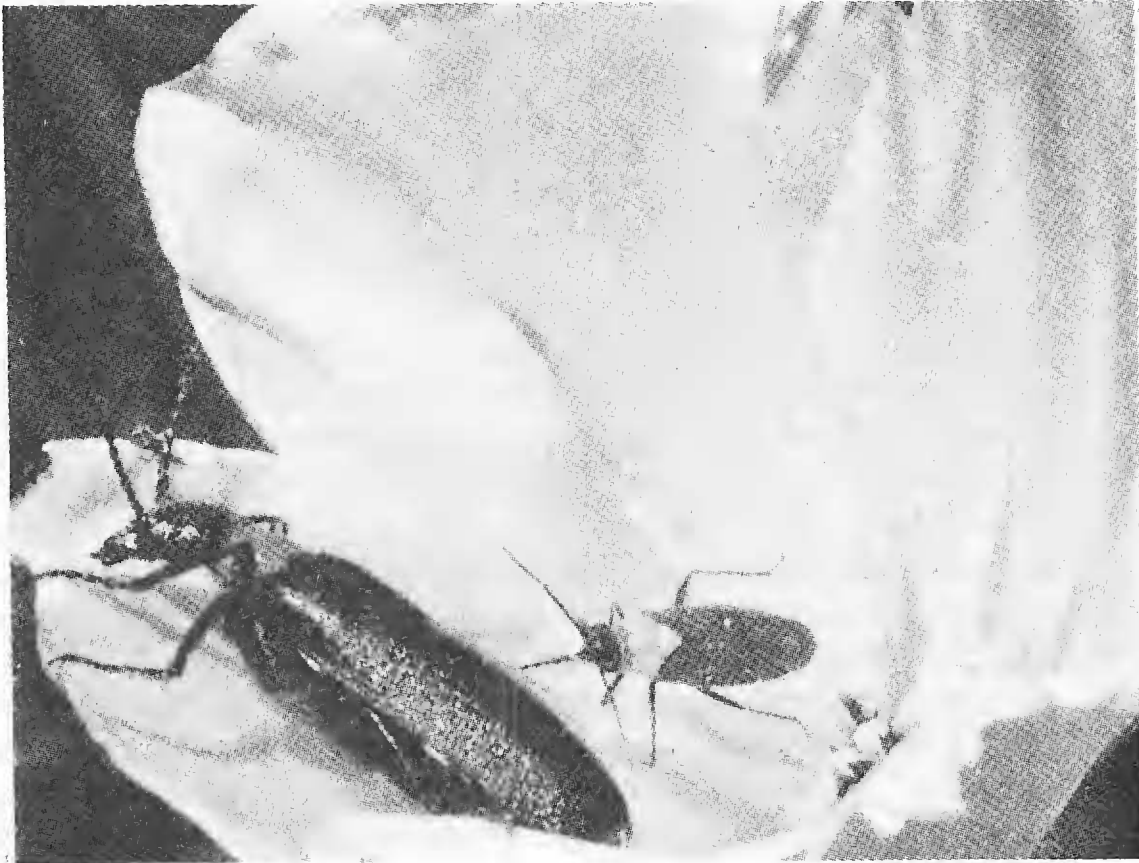


Fig. 1. Female *Hadronema uhleri* feeding on a *Lytta crotchii* at Gavilan Hills, Riverside Co., CA. (Photo by G. R. Ballmer).

mouthparts into a membranous area of the beetle's body. Areas commonly probed included the membrane between the tarsal claws, between the various leg segments, between the coxae and venter, and between the abdominal terga and sterna. Beetles normally became irritated immediately or within 10 sec. of being bitten. They reacted by kicking, scraping with the legs, and/or decamping. The *Hadronema* usually responded by quickly retreating. Occasionally mirids appeared to have difficulty extricating their mouthparts quickly enough and remained attached to the beetle for a short time after this negative behavior began. Reflex bleeding, a common response of meloids to external irritation, was never associated with mirid attacks. Most of the mirids remained on the plant during their attempts to feed. However, a few bugs climbed directly on the beetle's dorsum.

The *Hadronema* were most commonly associated with mated individuals. Mated pairs reacted less vigorously to mirid attacks than did solitary individuals. The latter commonly walked or flew from attack sites, although this movement could not definitely be attributed to the mirids. When a meloid moved, the remaining mirids became agitated. If the beetle moved to a nearby site on the same plant, most of the *Hadronema* followed either by walking or flying. If the beetle left the plant entirely, the mirids also quickly dispersed and were soon lost from sight.

Feeding behavior was also elicited when a drop of *Lytta moerens*

hemolymph was placed on the end of a match stick and introduced into a cage containing several *H. uhleri*. Several of the bugs quickly aggregated on and around the stick and placed the apex of their rostrum on that portion containing the fluid.

The effect of mirid attacks on the meloids, besides being a source of irritation, is unknown. On a few occasions, several *Hadronema* were observed feeding on soft cadavers of *Lytta moerens*. Whether or not they caused the death of the beetles was not determined.

Certain insects that parasitize adult meloids are sensitive to the odor of cantharidin, a component of meloid hemolymph, and can be captured in traps baited with this substance (Gornitz, 1937; Chandler, 1976). Consequently, it seemed likely that cantharidin would also be attractive to *Hadronema*. To verify this, baits were prepared by placing a small amount of cantharidin (synthetic powder) on 8-cm. diameter filter paper and dissolving it in acetone. After the acetone had evaporated, the cantharidin-impregnated filter papers were placed in petri dishes. Four baited dishes were tested in the field in Menifee Valley on 26 April 1977. No meloids were present at this locality, but several *Hadronema uhleri* had been observed in low numbers on black sage, *Salvia mellifera* Greene, several days previously. The baited dishes were placed on the ground under *Salvia* 10 m apart from one another. Alternating with these baited units were 4 dishes containing white filter paper that had been treated with acetone but not cantharidin.

Units were checked every 15 min. for 1 hr. During this time baited dishes collected 32 individuals of *H. uhleri*, with an average of 8 per unit (range, 6-11). None of the control units contained mirids. In addition to the *Hadronema*, two of the baited dishes contained a single individual of an unidentified species of the mirid genus *Sixeonotus*. Although the *Hadronema* were relatively abundant at the bait, 50 concurrent sweeps of black sage at a site adjacent to the baited areas captured only a single specimen.

All specimens of *Hadronema uhleri* collected and observed feeding on meloids were females. The sample of *H. bispinosa* from Flagstaff, AZ, contained both sexes but it was not noted if both males and females were attempting to feed. It is assumed that all of the mirids mentioned here are primarily phytophagous, and that their relationship with meloids is ancillary to their primary food sources.

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The required six months' notice is given of the possible use of plenary powers by the International Commission on Zoological Nomenclature in connection with the following names listed by case number: (see *Bull. Zool. Nom.* 34, part 3, 9 November, 1977).

- 2199 *Pangonia conica* Bigot, 1857: designation as type-species of *Mycteromyia* Philippi, 1865 (Insecta, Diptera, TABANIDAE).
- 2209 *Attelabus* Linnaeus, 1758 (Insecta, Coleoptera): request for confirmation of designation of type-species.
- 2217 *Cataphryxus* Shiino, 1936 (Crustacea, Isopoda): proposed conservation under the plenary powers.

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